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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WESSENDORF, TERESA D	

ART UNIT	PAPER NUMBER
1639	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	09/829,549	ENGLISH ET AL.	
	Examiner	Art Unit	
	TERESA WESSENDORF	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 32-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9, 32-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 8/18/08 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6-9, 32-34, 37-43, 45-47 and 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gough et al (Journal of Immunological Methods) in view of Kodadek et al (200100290240) and Petrenko et al (Methods in Enzymology).

Gough et al discloses throughout the article at e.g., page 98, col. 1 up to page 105 a phage-displayed method for generating antibody from a diverse library of antibodies fused to a vector and panning against the specific plant fungus, Phytophthora infestans. See further the section under the Materials and Method at page 98 which describes the specific steps of the phage display method. Gough does not disclose a non-Ig peptides as used in the method and a f8-1 peptide library.

Gough further discloses in **its entirety**, for example, at page 104:

> ….Affinity-purified MBP-scFv fusion proteins were assayed for binding to mycelial homogenates from a **range of plant pathogenic fungi *(Fig. 8)*.** Antibodies g15, s1 and s2 were characterised and all produced similar binding patterns. With the exception of the binding of g15 to P. cactorum, the highest ELISA signals were produced with homogenates of the Phytophthora species: P. infestans mating strains AI and A2, P. citricola. P. cactorum and P. megasperma. For each of the MBP-scFv fusions, a lower signal was obtained with a homogenate of Pythium deliense, the other member the Peronosporales, and even lower signals were obtained with homogenates of the unrelated species Ascochyta pisi. Fusarium culmorium and Aphanomyces euteiches. ***These results indicate that in general the scFvs isolated from the***

> ***panning and subpanning procedures recognize epitopes that are common to different Phytophthora species…*** (Emphasis added.)

See further, including but not limited to page 101, Figs. 2 and 3 and RESULTS; page 102, Figs. 4 and 5; page 103, Figs. 6 and 7 and at page 102, col. 1, first complete paragraph up to col. 2, first incomplete paragraph.

Kodadek et al discloses at paragraph [0009] that antibodies- which are not low molecular weight compounds- are relatively fragile compared to small molecules. These antibodies, using classical method, are tedious and expensive to obtain, particularly in large quantities. Antibodies are not easily rendered cell-permeable.

Kodadek further discloses at e.g., paragraph [0036]:

> …an important goal in chemical biology is to be able to obtain specific ligands for any biomolecule of interest. Impressive advances have been made in isolating molecules, many of which are antibodies or antibody-derived, that bind proteins and nucleic acid targets with well-defined macromolecular structures. However, the identification of sequence-specific, peptide-binding ligands has been more difficult. In addition, even antibodies have major drawbacks: they are tedious and expensive to generate, difficult to produce in large quantities, are relatively fragile molecules unsuitable for certain field applications, and often bind so tightly that they or their target proteins are damaged upon attempted extraction. Natural peptide-binding proteins or protein domains have been mutagenized to derive species with novel binding specificities (Schneider et al., 1999), but like antibodies, these are globular macromolecules. Thus, though the development of synthetic

> receptor molecules has seen important advances in the last few years, the field remains in its infancy. ***Therefore, it remains an important goal to develop non-macromolecular species that retain the favorable molecular recognition characteristics of antibodies, but can be identified quickly and easily and synthesized in large amounts.*** (Emphasis added.)

Petrenko discloses throughout the article at e.g., page 797 up to page 798 the use of f8-1 in phage method to obtain phage peptide that do not only include local functionalities that reside in a single variable peptide and its immediate surroundings but also global functions that inhere in the entire surface landscape.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a small molecular weight compounds as peptides in the method of Gough as taught by Kodadek and Petrenko. The numerous disadvantages in the use of antibodies as taught by Kodadek, above and the advantages taught by Petrenko in the use of peptide would provide the motivation to one having ordinary skill in the art.

Claims 44 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gough et al in view of Kodadek et al and Petrenko as applied to claims 1-4, 6-9, 32-34, 37-43, 45-47 and

49-51 above, and further in view of applicants' disclosure of known prior art.

Gough does not disclose the phage as f88-4. Applicants at page 11, line 28 up to page 12, line 2 of the instant specification states "…….methods for the production of the f88-4 phage-displayed peptide library have also been previously described….. This library displays 15-amino acid foreign peptides on 150 to 300 copies of major coat protein pVIII. The remainder of the 3900 copies of the pVIII subunits is derived from the wild type pVIII. The phage genome thus bears two pVIII genes encoding two different types of pVIII molecules. One pVIII is the recombinant displaying the foreign 15-mer peptide, while the other is the wild-type pVIII normally present on the phage. Because of the presence of two pVIII genes, the f88 virion consists of a mosaic pattern of wild-type and recombinant pVIII subunits. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ in the method of Gough the known phage f88-4 as disclosed by the instant disclosure of what is known in the prior art. One would be motivated to use this phage because of the characterizing properties of this phage e.g., the presence of two genes with a mosaic pattern of wild-type and recombinant p8. This mosaic pattern or landscapes (see Petrenko) include clones exhibiting

emergent properties that inhere in the entire surface architecture, not in the peptides by themselves.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gough et al (Jrnl. Of Immunological Methods, 1999) in view of Kodadek et al (US 20010029024) and Petrenko as applied to claims 1-4, 6-9, 32-34, 37-43, 45-47 and 49-51 above, and further in view of Smith (Methods in Enzymology).

Gough and Petrenko, as discussed above, do not disclose a random oligonucleotide of the sequence GCA GNN (NNN)7, as claimed. Petrenko discloses at page 797, col. 2 a random oligonucleotide sequence comprising the sequence GCA GNK(NNK)6 as opposed to the claimed GCA GNN(NNN)7 i.e., a variable NNK as opposed to NNN as claimed. However, Smith at page 243 discloses the two general types of synthetic degenerate oligo libraries. One is the fully degenerate codons (NNN) that encode all 20 amino acids with no bias beyond what is entailed by the unequal degeneracy of the genetic code while doped codons are biased toward one particular amino acid in order to introduce random substitutions into a base peptide sequence. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the fully degenerate NNN codon in the method of Gough as taught by Smith. One would be motivated

to use the NNN codon since this codon includes all the naturally occurring 20 amino acids with each of the 20 residues equally represented in the library i.e., with no bias to a particular amino acid. Smith teaches that either one of these degenerate oligo libraries (NNN or NNK) can be used to introduce random substitutions into a base peptide sequence.

Claims 35, 36 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gough et al in view of Kodadek et al and Petrenko as applied to claims 1-4, 6-9, 32-34, 37-43, 45-47 and 49-51 above, further in view of Qui (6,235,974).

Gough discloses several Phytophthora species one of which is the claimed Phytophthora infestans but not the other Phytophthora species as recited in e.g., claim 35. However Qui discloses throughout the patent at e.g., col. 22, line 50 up to col. 23, line 4 the different species of Phytophthora that are known in the art at the time of the invention. These different species have the same hypersensitive response to elicitor proteins. It would have been obvious to one having ordinary skill in the art to use other phytophthora species in the method of Gough as taught by Qui. Qui discloses that many different Phytophthora species respond equally to an e.g., elicitor protein. One would be motivated to use a particular Phytophthora

species if this is the species present in a plant causing fungi disease and the desire to eradicate its presence in plants.

The combined teachings of the prior art would have led one having ordinary skill in the art to the claimed method. The claims do not present anything new and unexpected from the known use of phage display method for screening a random library of peptides to identify peptide that has an affinity for the fungus surface.

Applicants' attention is further directed to the Board of Appeals and Patent's decision made on 6/18/08 as reiterated below:

Claim 1: According to Appellants, since Gough teaches "a library of scFv antibody fragments" Gough does not "teach or suggest the selection of non- immunoglobulin peptides that bind epitopes on the surface of a fungus" (App. Br. 9 (emphasis removed)). In this regard, Appellants point out that their Specification defines a "non-immunoglobulin peptide" to mean "a peptide which is not an immunoglobulin, a recognized region of an immunoglobulin, or contains a region of an immunoglobulin. For example, a single chain variable region of an immunoglobulin would be excluded from this definition" (App. Br. 9, n. 36; Spec. 9: 16-19). We are not persuaded by this argument which fails to account for the teachings of Kodadek and Petrenko. We

agree with Appellants that Gough is interested in isolating "antibodies to native biologically relevant, surface-exposed, epitopes [which] may lead to the production of immunological probes to identify specific cell components and determine their distribution and function" (FF 5; App. Br. 9-10). We disagree, however, with Appellants' intimation that the substitution of random peptide libraries for Gough's phage display library would not have been obvious in view of the combination of references relied upon (App. Br. 9-10). As Appellants appreciate, Gough "describe[s] methods for the isolation of antibodies specific for surface-exposed epitopes on certain species of Phytophthora" (App. Br. 8 (emphasis removed); FF 1). Petrenko teaches a 1.5 x 109-clone landscape phage library, teaches "landscape phage as alternative 'antibodies'", and exemplifies clones from the landscape phage library that bind dioxin (FF 15 and 18). Kodadek teaches phage- displayed pincer libraries that bind to an epitope target (FF 7-10). We find no limitation in Appellants' claimed invention that would exclude the use of either a landscape phage library as taught by Petrenko or a phage-displayed pincer library as taught by Kodadek. There is no evidence on this record that a person of ordinary skill in the art at the time this invention as made would not have appreciated that a clone selected through the use of Gough's

methodology from the library of either Petrenko or Kodadek would not be useful as a probe to identify specific cell components and determine their distribution and function as taught by Gough. Because claim 1 does not require that the selected peptides exhibit anti-fungal activity, we are also not persuaded by Appellants' assertion that Gough's "approach did not work" because "it 'showed no detectable anti- fungal activity for any of the antibodies'" (App. Br. 10; see also App. Br. 17).

Claim 1 requires that the selected peptides have affinity for the surface of a fungus. As Appellants recognize Gough' s method was "effective in identifying antibodies that bind to the surface of Phytophthora" (App. Br. 9). For the reasons set forth above we find that a person of ordinary skill in this art, following the teachings of the combination of references relied upon by the Examiner, would have been led to a method for identifying non-immunoglobulin peptides having an affinity for the surface of a fungus. Appellants' note that Kodadek teaches "early efforts by Kodadek and co-workers to isolate small peptides using phage display methods 'failed completely'" (App. Br. 13 (emphasis removed); Kodadek ¶ 0038). From this Appellants assert that Kodadek teaches away from the use of phage display methods; that Kodadek teaches that "random peptides.., are inadequate for his purpose"; and that "Kodadek and Gough et al.

represent mutually exclusive domains, and, therefore, any suggestion of substitution of the peptides of Kodadek into the methods of Gough et al. would not be feasible" (App. Br. 12-13 (emphasis removed)). Because Appellants have taken Kodadek's statement out of context, we are not persuaded by Appellants' assertions. Kodadek was interested in isolating "heteromeric complexes comprised of small peptides, even smaller than lucine zippers, that could be employed as EBMs" (Kodadek ¶ 0038). Kodadek reports, however, that due to the size of the molecules "it was not clear how feasible this endeavor would be" (id.). In this regard, Kodadek reports that early attempts to isolate heteromeric complexes comprised of small peptides that could be employed as EBMs were not successful (id.). This, however, is not the end of the story. Kodadek teaches that "the inventor has now demonstrated that it is indeed feasible to isolate highly specific complexes between relatively small peptides" (Kodadek ¶ 0039). Kodadek In this regard, Kodadek teaches, as one embodiment, phage displayed pincer libraries that are used to identify phage clones containing EBMs "that bind to an immobilized epitope target" (Kodadek ¶ 0132). Accordingly, we are not persuaded by Appellants' emphasis on Kodadek's early efforts. There is no evidence on this record to suggest that the substitution of Kodadek's randomized peptide phage display

library into Gough's method would not result in a productive method of identifying peptides having affinity for the surface of a fungus. Further, such a position would be inconsistent with Petrenko who teaches "landscape phage as alternative 'antibodies'" and exemplifies clones from the landscape phage library that bind dioxin (FF 18). In this regard, we are not persuaded by Appellants' arguments directed at Petrenko. According to Appellants, Petrenko teaches "panning phage displayed peptides against.., a single known target seeking to identify phage clones that exhibit 'global properties' across the entire phage surface" (App. Br. 15 (emphasis removed)). From this Appellants assert that since Gough's "target was a multitude of unknown surface epitopes presented on the surface of Phytophthora" and Gough was "seeking to identify specific antibodies that bind to the surface of Phytophthora," one would not be motivated to modify Gough with Petrenko. We are not persuaded. To the extent that Appellants would suggest that the presence of more than one target, or unknown target(s), will confound the phage in the library and lead to the failure of a binding event, we disagree. The presence of a number of targets would reasonably be expected to enhance the binding opportunities of the phage in the library. There is no evidence on this record to suggest otherwise. As Petrenko explains,

"landscape phage are not designed and synthesized one by one with particular goals in mind. Instead, phage with particular attributes are selected from huge libraries with random surface architectures" (FF 17). In this regard, Petrenko teaches "landscape phage as alternative 'antibodies'" and exemplifies a clones from the landscape phage library that bind dioxin (FF 18). We are also not persuaded by Appellants' assertion that "[i]t is not enough that the peptide libraries, or specifically Petrenko et al.'s f8-1 peptide library, could be theoretically substituted into the methods of Gough" (App. Br. 16). "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1739 (2007). For the reasons set forth above, we find that a person of ordinary skill in this art would have reasonably expected to successfully identify peptides which have affinity for a fungus using the method taught by the combination of references relied upon. On reflection, we find that the Examiner has provided the evidence necessary to establish a prima facie case of obviousness. Accordingly, the burden of coming forward with evidence or argument was properly shifted to Appellants. In re Rijckaert, 9 F.3d 1531, 1532 (Fed. Cir. 1993). For the foregoing reasons, Appellants have failed to carry their burden.

Accordingly, we affirm the rejection of claim 1 under 35 U.S.C § 103 (a) as unpatentable over the combination of Gough, Kodadek and Petrenko. Claims 2-4, 6-8, 32-34, 37-40, 45-47, and 49-51 fall together with claim 1.

Claim 42: Claim 42 depends from, inter alia, claim 1 and further limits the peptide library to an fS-1 peptide library. As claim 42 does not require any particular peptide length we are not persuaded by Appellants' arguments regarding peptide length (App. Br. 18-20). Further, we are not persuaded by Appellants' assertion that one would not have been motivated to utilize a fS- 1 phage library as taught by Petrenko because Gough's "method 'showed no detectable antifungal activity for any of the antibodies'" (App. Br. 20). Claim 42 does not require that the selected peptide exhibit antifungal activity. Further, for the reasons discussed above, we are not persuaded by Appellants' assertion that "Kodadek said it would not work" (id.). On reflection, we find that the Examiner has provided the evidence necessary to establish a prima facie case of obviousness. Accordingly, the burden of coming forward with evidence or argument was properly shifted to Appellants. Rijckaert, 9 F.3d at 1532. For the foregoing reasons, Appellants have failed to carry their burden. Accordingly, we affirm the

rejection of claim 42 under 35 U.S.C § 103(a) as unpatentable over the combination of Gough, Kodadek, and Petrenko.

Claims 44 and 49 stand rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Gough, Kodadek and Petrenko. The claims have not been argued separately and, therefore, stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Therefore, we limit our discussion to representative claim 44. Claim 44 depends from, inter alia, claim 1 and further limits the peptide library to an f88-4 peptide library. The Examiner relies on the combination of Gough, Kodadek, and Petrenko as discussed above. Gough, Kodadek, and Petrenko do not teach an f88-4 peptide library. To make up for this deficiency, the Examiner relies on Appellants' Specification (Spec. 11:28 - 12:2) to teach that "methods for the production of the f88-4 phage-displayed peptide library have.., been previously described [(Zhong et al., J. Biol. Chem. 269:24183-24188, 1994; Smith and Scott, Methods' in Enzymology, 217:228-257, 1993; Smith, Gene, 128:1-2, 1993 and references cited therein)]" (Ans. 5). Based on this evidence the Examiner finds that it would have been prima facie obvious to a person of ordinary skill in the art to have utilized the f88-4 library in the method taught by the combination of Gough, Kodadek, and Petrenko (id.). Appellants admit that "[a]t the time of Appellants' invention,

random peptide libraries in general were known in the art, and included such random peptide libraries as the f8-1 and the f88-4 phage-displayed peptide libraries" (App. Br. 20). Accordingly, we find no error in the Examiner's prima facie case of obviousness. Appellants assert that while the references they cite to teach f88-4 peptide libraries predate Gough by "at least three years" Gough "still selected a phage-antibody library of scFv fragments" (App. Br. 21 (emphasis removed)). We are not persuaded. Gough teaches the use of phage libraries to identify molecules (scFv fragments) that have affinity for Phytophthora. In addition, the evidence relied upon by the Examiner teaches the methodology for the identification of molecules (peptides) that have affinity for target molecules (FF 1-19) and the use of f88-4 phage. Contrary to Appellants' intimation, Gough's interest in scFv phage libraries does not shut the door on the use of other phage libraries (e.g., those taught by Kodadek and Petrenko) to identify molecules that have affinity for the surface of a fungus. For the foregoing reasons, we find no error in the Examiner's conclusion that it would have been prima facie obvious to have utilized f88- 4 peptide libraries in the method taught by the combination of evidence relied upon to identify peptides having affinity for the surface of a fungus. As claim 44 does not require antifungal activity, we are not persuaded by

Appellants' arguments based on antifungal activity (App. Br. 21). For the foregoing reasons, we affirm the rejection of claim 44 under 35 U.S.C § 103(a) as unpatentable over the combination of Gough, Kodadek, and Petrenko. Claim 49 falls together with claim 44.

Claim 5 stands rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Gough, Kodadek, Petrenko, and Smith. Claim 5 depends from, inter alia, claim 1 and further limits the sequence of the random oligonucleotide to GCA GNN (NNN)7 or SEQ ID NO: 1. The Examiner relies on the combination of Gough, Kodadek, and Petrenko as discussed above. In addition, the Examiner finds that Petrenko teaches a random oligonucleotide sequence comprising the sequence GCA Gnk (nnk)6 nnG "as opposed to the claimed GCA GNN (NNN)7" (Ans. 7; FF 20). To make up for this deficiency the Examiner relies on Smith to teach the use of phage libraries with fully degenerate oligonucleotide inserts (Arts. 6; FF 23). Based on this evidence the Examiner concludes that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to use" phage libraries with fully degenerate oligonucleotide inserts in the method taught by the combination of Gough, Kodadek, and Petrenko. In response, Appellants assert that Smith provides no suggestion or motivation to utilize

degenerate oligonucleotides in the method of Gough, and that there is no reason to believe that the substitution of random peptide libraries formed using degenerate oligonucleotides would even work. We disagree. The combination of Gough, Kodadek, and Petrenko teach a method wherein randomized peptide phage display libraries are used to identify a peptide having affinity for the surface of a fungus. Every one of these references teaches a phage display library in which at least one peptide (which includes scFV) has some affinity for a target. There is no reason to expect that a phage library comprising fully degenerate oligonucleotides would not contain at least one peptide that exhibits some level of affinity for the surface of a fungus. Further, there is no evidence on this record which would support a contrary conclusion. Therefore, we are not persuaded by Appellants' assertion to the contrary. Accordingly, we affirm the rejection of claim 5 under 35 U.S.C § 103 (a) as unpatentable over the combination of Gough, Kodadek, Petrenko, and Smith. 4. Claims 35, 36, and 48 stand rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Gough, Kodadek, Petrenko, and Qui. The claims have not been argued separately and therefore stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Therefore, we limit our discussion to representative claim 35. Claim 35 depends from, inter alia,

claim 1 and further limits the target fungus to one selected from the group consisting of Phytophthora sojae, Phytophthora capsica, Phytophthora palmivora, Phytophthora cinnamomi, and Phytophthora parasitica. The Examiner relies on the combination of Gough, Kodadek, and Petrenko as discussed above, but recognizes that this combination of references does not specifically disclose the Phytophthora species recited in claim 35 (Arts. 7). To make up for this deficiency the Examiner relies on Qui to teach "the different species of Phytophthora... are known in the art at the time of the invention" (id.). Based on this evidence the Examiner concludes that it would have been obvious to one having ordinary skill in the art to use other phytophthora species in the method taught by the combination of references relied upon (Arts. 7-8). In response Appellants acknowledge that a number of Phytophthora species were known in the art prior to their filing date (App. Br. 23). Nevertheless, Appellants assert that Qui does not suggest that any of the fungi would be desirable in the methods of Gough (App. Br. 24). We are not persuaded. The combination is not Qui and Gough. To the contrary, the Examiner relies on the combination of Gough, Kodadek, Petrenko, and Qui. For the foregoing reasons, we find no error in the Examiner's prima facie case of obviousness. We find no evidence or persuasive argument that a person of

ordinary skill in the art would not recognize that peptides having affinity for the surface of any number of fungi, including the Phytophthora species capsici, cinnamoni, and parasitica could have been identified using the methodology taught by the combination of references relied upon. Further, there is no evidence on this record that one of ordinary skill in the art would not have been able to identify peptides that bind the surface of any one of the fungi taught by Qui that would be useful as probes to identify specific cell components and determine their distribution and function as taught by Gough (FF 5).

The claimed antifungal property of the peptide is a property inherent, if not obvious, to the prior art peptide e.g., Gough. The peptide of Gough exhibits similar, if not the same, binding (i.e., inhibiting) specificity to a fungus surface. This is recognized by applicants at the following paragraphs of the instant application, published application Patent No. 20020052484:

> [0076] Before being used to transform plants, fusion proteins containing antifungal peptides can be screened for activity using the phage display method of the present invention. In general, a fusion protein can be construction containing, an antifungal peptide… Phage displayed fusion proteins so constructed can then be screened using the method of the present invention to select those fusion

proteins that bind to a target pathogenic fungus and result in alternations which limit pathogenicity.

[0088] …..[B]binding was specific for the zoospore stage:…. from cysts-about the same background binding observed with control vector phage (FIG. 5).

Accordingly, a peptide's ability to bind a fungus surface which hinders fungus would inherently function as an antifungal peptide. The fact that Gough teaches inhibition of fungus, albeit does not expressly states that the peptide is antifungal although implicitly, would suffice the finding of obviousness. It would be within the ordinary skill in art to determine what would be an inherent property or function of the binding (inhibiting) peptide.

Applicants are, in effect arguing that a structure suggested by the prior art and, hence, potentially in possession of the public, is patentable to them because it also posses an inherent but hitherto unknown function which they claim to have disclosed. This is not the law. A patent on such a structure would remove the public that which is in the public domain by virtue of its inclusion in, or obviousness from the prior would. In re Wiseman 201 USPQ658.

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a

person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. When considering obviousness of a combination of known elements, the operative question is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." KSR International Co. v. Teleflex Inc., 550 USPQ2d 1385 (2007).

Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TERESA WESSENDORF whose telephone number is (571)272-0812. The examiner can normally be reached on flexitime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on 571-272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TERESA WESSENDORF/

Primary Examiner, Art Unit 1639

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	09/829,549	ENGLISH ET AL.	
	Examiner	Art Unit	
	TERESA WESSENDORF	1639	